



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/057,694  | 01/23/2002  | Chanchal Chatterjee  | 018926-008800US     | 8890             |
| 20350   | 7590        | 05/05/2005           | EXAMINER            |                  |
| TOWNSEND AND TOWNSEND AND CREW, LLP<br>TWO EMBARCADERO CENTER<br>EIGHTH FLOOR<br>SAN FRANCISCO, CA 94111-3834 |             |                      | DO, CHAT C          |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2193                |                  |

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                      |  |
|------------------------------|------------------------|----------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b>  |  |
|                              | 10/057,694             | CHATTERJEE, CHANCHAL |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>      |  |
|                              | Chat C. Do             | 2193                 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 4-7, 22-42, 45 and 46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-15, 18-21, 43 and 44 is/are rejected.
- 7) ☒ Claim(s) 16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/15/02; 10/31/03</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

*[Handwritten signature]*

### DETAILED ACTION

1. Claims 1-3, 8-21, and 43-44 are examined.
2. Claims 4-7, 22-42, and 45-46 are withdrawn.

#### *Election/Restrictions*

3. This application contains claims directed to the following patentably distinct species of the claimed invention:
  - a. Species I: claims 1-28 and 43-44, drawn to a method in signal processor for filtering utilizing either 2 or 3 samples.
    - i. Sub-Species Ia: claims 23-25, drawn to filtering with 3 adjacent samples as  $X = (M+N+1) \gg 1$  or  $X = ([\{A+B+1\} \gg 1] + [\{C+0+1\} \gg 1]) \gg 1$ .
    - ii. Sub-Species Ib: claims 26-28, drawn to filtering with 3 adjacent samples as  $X = (\{A+B+C+1\} \gg 1)$ .
    - iii. Sub-Species Ic: claims 8-13, drawn to filtering with 2 adjacent samples as  $X = ((\{A+B+1\} \gg 1) \ll S + (\{A+B+1\} \gg 1) \ll R)$ .
    - iv. Sub-Species Id: claim 7, drawn to filtering with 2 adjacent samples as  $X = ((A + ((A+B+1) \gg 1) + 1) \gg 1)$ .
    - v. Sub-Species Ie: claims 4-6, drawn to filtering with 2 adjacent samples as  $X = ((A+B+1) \gg 1)$ .

- b. Species II: Claims 29-41 and 45-46, drawn to a method in signal processor for filtering utilizing 4 samples.
- c. Species III: Claim 42, drawn to a method in signal processor for filtering utilizing 8 samples.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species or a single disclosed sub-species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1, 18-19, 22, 43-44 are generic for sub-species Ia and Ib; and claims 1-3, 14-21, 43-44 are generic for sub-species Ic, Id, and Ie.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

- 4. Applicant's election without traverse of Species I and Sub-Species Ic claims 1-3, 8-21, and 43-44 in the reply filed on 04/08/2005 is acknowledged.

***Oath/Declaration***

- 5. Applicant has not given a post office or a resident address anywhere in the application papers as required by 37 CFR 1.33(a), which was in effect at the time of filing of the oath or declaration. A statement over applicant's signature providing a complete post office address is required.

***Claim Objections***

6. Claims 3 and 8-21 are objected to because of the following informalities:

Throughout claims 3 and 8-21, the applicant is advised to clearly defined the following symbols for clarification purposes: ">>", "<<", and "~".

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 8-15, 18-19, and 43-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Dijkstra (U.S. 6,795,841).

Re claim 1, Dijkstra discloses in Figures 2-3 a method in a signal processor for filtering samples in a digital signal (e.g. abstract), the method comprising: generating (e.g. Figure 3 with 32) an approximate filtered sample as a function of less than four samples of the digital signal (e.g. only samples in term of A and B); generating a correction (e.g. 34) as a function of the less than four samples (e.g. only samples in term of A and B); and generating a filtered sample (e.g. either 36 or 38) by modifying the approximate filtered sample with the correction (e.g. adding or subtracting 34).

Re claim 2, Dijkstra further discloses in Figures 2-3 the less than four samples are only two samples (e.g. only two samples A or B in Figure 3).

Re claim 3, Dijkstra further discloses in Figures 2-3 the two samples are a first fixed-point number, A (e.g. 26 in Figure 3), and a second fixed-point number, B (e.g. 28 in Figure 3), wherein generating the approximate filtered sample includes calculating  $(A+B+1) \gg 1$  (e.g. either 36 or 38 with right shift by 1).

Re claim 8, Dijkstra further discloses in Figures 2-3 generating the approximate filtered sample further includes: calculating  $E = ((A+B+1) \gg 1) \ll S$ ; calculating  $F = ((A+B+1) \gg 1) \ll R$ ; and calculating the approximated filtered sample as  $E + F$ ; wherein S and R are positive fixed-point numbers (e.g. let S and R be zero, then approximated sample is  $(A+B+1)$  which is 38 before right shift in Figure 3)

Re claim 9, Dijkstra further discloses in Figures 2-3 generating the correction includes: calculating  $Q = \sim(A \text{ xor } B)$ ; masking Q with the number one; calculating  $G = Q \ll (S-1)$ ; calculating  $H = Q \ll (R-1)$ ; and calculating the correction as  $G + H$  (e.g. let S and R be zero, then correction is  $\sim(A \text{ xor } B)$  which is 34 in Figure 3).

Re claim 10, Dijkstra further discloses in Figures 2-3 generating the filtered sample includes: calculating (e.g. either step 36 or 38 in Figure 3) the filtered sample as the approximate filtered sample added with the correction; and right-shifting the filtered sample by N-1 bits, wherein N is a positive fixed-point number (e.g.  $N = 2$ ).

Re claims 11-12, they have same limitations as claims 8-10. Thus, claims 11-12 are also rejected under the same rationale as cited in the rejection of rejected claims 8-10.

Re claim 13, Dijkstra further discloses in Figures 2-3 generating the filtered sample includes calculating the filtered sample as the approximate filtered sample added with the correction (e.g. 38 in Figure 3).

Re claim 14, Dijkstra further discloses in Figures 2-3 the two samples are fixed-point numbers, and wherein generating the correction includes: calculating the correction as the exclusive OR (XOR) of the two samples; and masking the correction with the integer one (e.g. 34).

Re claim 15, Dijkstra further discloses in Figures 2-3 generating the correction further includes, prior to the masking step, generating a bit-wise complement of the correction (e.g. 34).

Re claim 18, Dijkstra further discloses in Figures 2-3 generating the filtered sample includes adding the correction to the approximate filtered sample (e.g. 38).

Re claim 19, Dijkstra further discloses in Figures 2-3 generating the filtered sample includes subtracting the correction from the approximate interpolated sample (e.g. 36).

Re claim 43, it is a computer program on computer readable medium claim of claim 1. Thus, claim 43 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 44, it is a system claim of claim 1. Thus, claim 43 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

*Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being obvious over Dijkstra (U.S. 6,795,841) in view of Intel ("IA-32 Intel<sup>R</sup> Architecture Software Developer's Manual").

Re claims 20-21, Dijkstra does not disclose in Figures 2-3 the microprocessor is an Intel microprocessor with MMX<sup>TM</sup>/SSE, wherein the two samples are 8-bit fixed-point or integers numbers, wherein the steps of generating the approximate filtered sample, generating the correction and generating the filtered sample include executing the instructions:

```
{ pxor C REG, A REG ;  
pand C _REG, CONST;  
pavgb A REG, B REG ;  
psubb A REG, C REG ; }  
  
{ pxor C REG, A REG ;  
pandn C _REG CONST;  
pavgb A REG, B-REG ;  
paddb A REG, C-REG ;}
```

wherein A-REG is a register that initially includes one of the two samples, B-REG is a register that includes the other of the two samples, C-REG is a register that



initially includes the other of the two samples, and CONST is a constant that includes the eight-bit number 0x01. However, Intel discloses in pages 3-537, the microprocessor is an Intel microprocessor with MMX<sup>TM</sup>/SSE (e.g. pages 3-537), wherein the two samples are 8-bit fixed-point or integers numbers, wherein the steps of generating the approximate filtered sample, generating the correction and generating the filtered sample (e.g. averaging) include executing the instructions: pxor (e.g. pg 3-657), pand (e.g. pg 3-540), pavgb (e.g. pg 3-545), psubb (e.g. pg 3-630), pandn (e.g. pg 3-542), paddb (e.g. pg 3-529). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the intel microprocessor with all the instructions above as cited in Intel's manual into Dijkstra's invention because it would enable to increase the system performance by utilizing pre-instructions in Intel processor.

#### ***Allowable Subject Matter***

11. Claims 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 6,512,523 to Gross discloses an accurate averaging of elements using integer averaging.

- b. U.S. Patent No. 6,711,597 to O'Donnell discloses an interpolation method using pre-emphasized input samples.
- c. U.S. Patent No. 6,687,771 to Symes discloses a parallel processing of multiple data values within a data word.

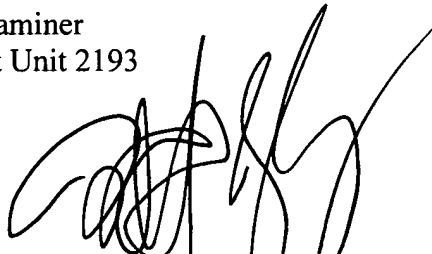
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 29, 2005

Chat C. Do  
Examiner  
Art Unit 2193



TODD INGBERG  
PRIMARY EXAMINER